

SOME MYCENEAE OF THE HIMALAYAN FOOTHILLS

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Among the species of *Mycena* and related genera of the Himalayan foothills described in this paper, the following are proposed as new: *Mycena abietina*, *M. bathyrrhiza*, *M. cinabarina*, *M. coalita*, *M. gentilis*, *Hydropus eburneus*, and *Xeromphalina aspera*.

The Himalayan chain stretches across the northern part of the Indian subcontinent from the Hindu Kush in Afghanistan to the west to the Khasya Hills in Assam to the east. The central and more readily accessible parts of this chain – in Kashmir, India, Nepal, Sikkim – have frequently been visited by botanical expeditions, resulting, among other things, in a gradual increase in the number of mycological publications. It is perhaps not without reason, however, that most papers are silent about the *Mycenas*. The very size of most of these fungi may have convinced collectors that such denizens (if noticed at all) were not worth the trouble.

Several of the species described in the present paper were collected in 1964 by my colleague Dr. C. Bas in India in the states of the Punjab, Uttar Pradesh, and Himachal Pradesh. It may be noted that, surprisingly, none of the species collected by Hooker and described by Berkeley from Sikkim and the Khasya Hills (1850: 78–81 and 1852: 101–103) and recognizable as belonging to the genus *Mycena* have been found in the region searched by Dr. Bas. One possible explanation is that part of Hooker's collections came from much farther to the east and from higher altitudes, and another is that a number were collected much earlier in the season—May and June. The collections of Dr. Bas were made in August and September and, in view of the general experience in Europe, these months may not have been particularly favourable for *Mycenas*. Given the enormous expanse of the Himalayas, however, and the great range of altitudinal and vegetational differences, it does not seem unreasonable to expect further discoveries. The present paper is hopefully meant to stir the curiosity.

Grateful thanks are due to the authorities of the herbaria at Edinburgh (E) and Kew (K) for the loan of material.

KEY TO THE SPECIES TREATED

1. Spores amyloid.
2. Hyphae of the pileipellis diverticulate, excrescences tending to form dense masses.
3. Lamellae tender, c. 20 reaching the stipe.
 4. Lamellae broadly adnate, decurrent with a short tooth. Pleurocystidia present:
 3. *Mycena abietina* (sect. *Fragilipedes*)
 4. Lamellae narrowly adnate. Pleurocystidia absent:
 4. *Mycena bathyrrhiza* (sect. *Fragilipedes*)

3. Lamellae tough, 24–35 reaching the stipe. Pleurocystidia absent:
 1. *Mycena galericulata* (sect. *Mycena*)
2. Hyphae of the pileipellis smooth or only sparsely covered with excrescences.
 5. Cheilocystidia smooth.
 6. Spores up to 5 µm broad.
 7. Lamellar edge concolorous with the sides or paler.
 8. Lamellar edge concave. Spores 2.2–2.7 µm broad:
 11. *Xeromphalina aspera*
 8. Lamellar edge convex. Spores more than 3.5 µm broad:
 7. *Mycena pura* (sect. *Calodontes*, subsect. *Purae*)
 7. Lamellar edge darker than the sides, dark red:
 6. *Mycena cinnabarina* (sect. *Calodontes*, subsect. *Marginatae*)
 6. Spores 5.8–7.1 µm broad; pleurocystidia absent. Trama of the stipe sarco-dimitic: 10. *Hydropus eburneus*
 5. Cheilocystidia apically covered with very coarse excrescences.
 9. Lamellae toughish. Hyphae of the pileipellis embedded in gelatinous matter:
 2. *Mycena tintinnabulum* (sect. *Mycena*)
 9. Lamellae tender. Hyphae of the pileipellis not gelatinized:
 5. *Mycena coalita* (sect. *Fragilipedes*)
 1. Spores inamyloid.
 10. Cheilocystidia apically and ventrally almost equally broad. Pleurocystidia present:
 9. *Mycena olida* (sect. *Hiemales*, subsect. *Hiemales*)
 10. Cheilocystidia apically much narrower than ventrally. Pleurocystidia absent:
 8. *Mycena gentilis* (sect. *Calodontes*, subsect. *Violacellae*)

MYCENA (Pers.) Roussel

Agaricus [sect.] *Mycena* Pers., Tent. Fung. Suppl. (1797) 69. — *Agaricus* sect. *Mycena* Pers., Syn. meth. Fung. (1801) XVI, 375. — *Mycena* (Pers.) Roussel, Flore Calvados, 2nd ed. (1806) 64. — Type species: *Agaricus galericulatus* Scop.

Mycena sect. *Mycena*

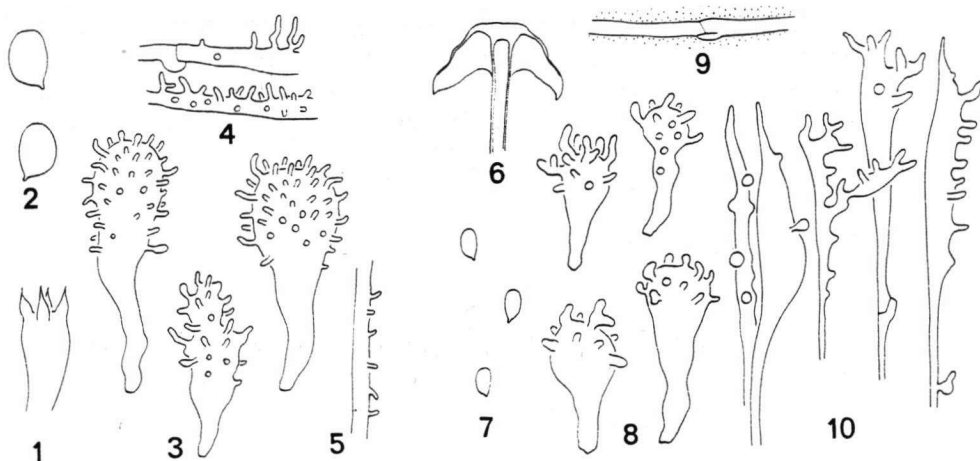
Agaricus trib. *Propriae* Fr., Obs. mycol. 2 (1818) 155. — Lectotype: *Agaricus galericulatus* Scop.
For further synonymy, see Maas Geesteranus (1985: 339).

1. *Mycena galericulata* (Scop.: Fr.) S.F. Gray — Figs. 1–5

Agaricus galericulatus Scop., Flora carniol., ed. 2, 2 (1772) 455; Fr., Syst. mycol. 1 (1821) 143. — *Mycena galericulata* (Scop.: Fr.) S.F. Gray, Nat. Arrang. Br. Pl. 1 (1821) 619. — Neotype: 'Fungi of Yugoslavia / *Mycena galericulata*' (No. 982.217-639; L).

For further synonymy, see Maas Geesteranus (1985: 346).

Basidiomata subfasciculate. Pileus 12–35 mm across, conical to campanulate, with little pronounced, rounded umbo, smooth to shallowly sulcate, appearing glabrous, pale brownish beige, darker at the centre, becoming darker flesh-coloured brown with age, and the surface becoming slightly fissured. Flesh thin except at the centre of the pileus,



Figs. 1–5. *Mycena galericulata* (Bas 4142; L). 1. Basidium; 2. spores; 3. cheilocystidia; 4. hyphae of the pileipellis; 5. hypha of the cortical layer of the stipe. — Figs. 6–10. *Mycena tintinnabulum* (Bas 4257; L). 6. Section of pileus (dried); 7. spores; 8. cheilocystidia; 9. hypha of the pileipellis; 10. terminal cells of hyphae of the cortical layer of the stipe. (Fig. 6, $\times 2$; all others, $\times 700$.)

pale beige, in age flushed with pink. Odour raphanoid when crushed. Taste raphanoid. Lamellae 24–35 reaching the stipe, elastic-tough, ascending, up to 4.5 mm broad, ventricose, adnate, decurrent with a short tooth, smooth to veined, very pale beige, becoming flushed with a reddish tint, edge convex, concolorous. Stipe 35–90 \times 1–3 mm, hollow, tough, equal, terete to somewhat compressed, straight or slightly flexuous, smooth, finely pruinose at the apex, glabrous farther below, shiny, beige to more brownish or with a pinkish shade, the base somewhat rooting, covered with whitish fibrils.

Basidia (none seen fully mature) 24–27 \times 10–11 μ m, clavate, 4-spored, clamped, with plump sterigmata 7–8 μ m long. Spores (not quite mature) 7.2–9.0 \times 5.8–6.3 μ m, broadly pip-shaped, smooth, amyloid. Cheilocystidia 40–45 \times 9–14.5 μ m, forming a sterile band, clavate, clamped, covered with not very numerous, simple, mostly curved excrescences 2–3.5 \times 1–2 μ m. Pleurocystidia absent. Lamellar trama weakly brownish vinyescent in Melzer's reagent. Hyphae of the pileipellis 2–4.5 μ m wide, clamped, covered with simple to furcate, cylindrical excrescences 2–7 \times 1–2 μ m. Hyphae of the cortical layer of the stipe 1.5–2.5 μ m, wide, clamped, sparsely covered with simple, cylindrical excrescences 1.8 \times 1 μ m.

Material examined (all collections 4-spored). PAKISTAN: West Pakistan, Patriata, Murree Hills, 20 Aug. 1953, *Sulian Ahmad* 12069, on rotten stump of *Pinus excelsa* (K); Murree Hills, Khanspur, 20 Sept. 1975, Shi Mycol. Herb. 2142, on logs (K); same locality, same date, Shi Mycol. Herb. 2148, on the ground (K).

INDIA: Himachal Pradesh, Narkanda, 11 Aug. 1964, *C. Bas* 4142, on decaying log in forest of *Abies pindrow* and *Picea smithiana*, c. 2750 m alt. (No. 964.289–260; L).

The macroscopic description of the species is adapted from the notes accompanying collection *Bas* 4142, complemented by my own observations on the dried material. The microscopic details are based on reexamination of this collection.

Berkeley (1852: 101) recorded *Agaricus galericulatus* from Sikkim collected by [J.D.] Hooker in 1849 (Ser. 2, No. 6). I have studied this material (preserved at K) which consists of four separate basidiomes and a fasciculate group of six specimens. This fasciculate habit is unusual in *Mycena galericulata*. The hyphae of both the pileipellis and the cortical layer of the stipe appear to be smooth. These two last named characters combined with the tender consistency of the lamellar trama show that Hooker's No. 6 is not *Mycena galericulata* and very probably not even a member of section *Mycena*. The poor quality of the material, of which neither basidia nor cystidia could be made out, defies identification.

2. *Mycena tintinnabulum* (Fr.) Quél. — Figs. 6–10

Agaricus tintinnabulum Fr., Epicr. Syst. mycol. (1838) 107. — *Mycena tintinnabulum* (Fr.) Quél., Mém. Soc. Emul. Montbél. II 5 (1872) 105. — Type locality: Sweden.

For further synonymy, see Maas Geesteranus (1985: 364).

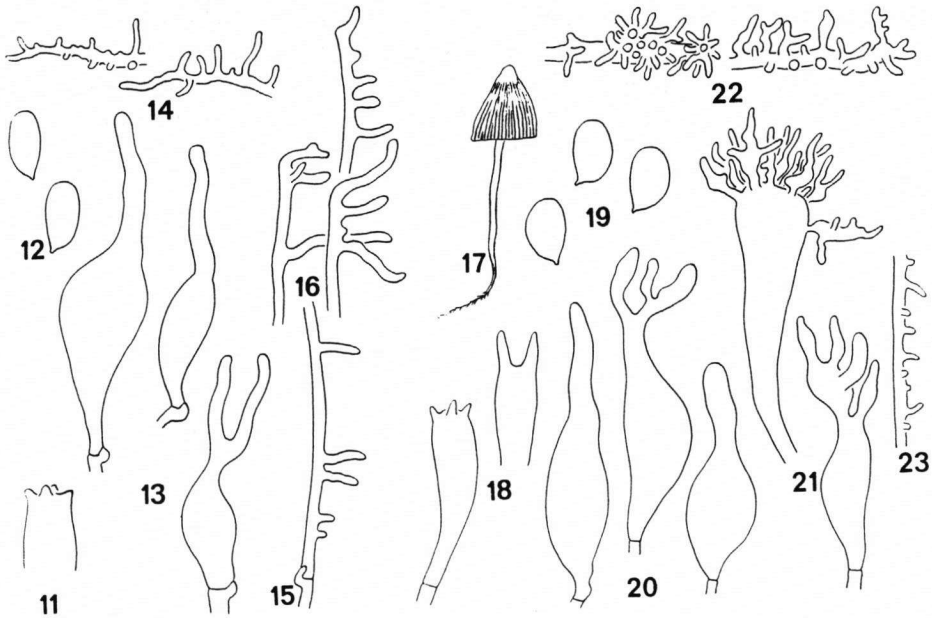
Basidiomata fasciculate. Pileus 6–12 mm across, parabolical, conical or convex, somewhat umbonate, centrally flattened or slightly depressed, smooth, translucent-striate, glabrous, fairly dark grey-brown to pale beige. Flesh thin, except at the centre of the pileus, more or less concolorous with the pileus. Odour and taste indistinctive. Lamellae 21 reaching the stipe, fairly tough, ascending, up to 2.5 mm broad, broadly adnate, decurrent with a short tooth, smooth to ribbed, dorsally intervenose, pale grey-brown at the base, whitish towards the edge, becoming flushed with pink with age, the edge shallowly convex, whitish. Stipe 15–25 × 0.6–1.8 mm, hollow, equal or somewhat narrowed below, curved, terete, smooth, pruinose above, glabrous farther down, whitish at the apex, pale yellowish sepia brown below, the base densely covered with long, rather coarse, whitish fibrils.

Basidia (none seen fully mature) c. 17 × 4.5 µm, clavate, clamped, 4-spored, with sterigmata c. 2.7 µm long. Spores 4.7–5.5 × 2.8–3.1 µm, pip-shaped, smooth, amyloid. Cheilocystidia 21.5–28 × 7–11 µm, locally forming a short sterile band, clavate, covered with fairly few, unevenly spaced, coarse, simple to furcate, straight to curved excrescences 2.5–8 × 1.8–2.5 µm. Pleurocystidia absent. Lamellar trama weakly brownish vinctous in Melzer's reagent. Hyphae of the pileipellis 2.5–3.5 µm wide, clamped, embedded in gelatinous matter, smooth. Hyphae of the cortical layer of the stipe 1.3–2.5 µm wide, clamped, easily separable from each other (indicating the presence of gelatinous matter), smooth or with a few scattered, coarse excrescences, the terminal cells 3.5–13.5 µm wide, fusiform to clavate, simple to furcate, diverticulate, excrescences 2.5–6.5 × 1–3.5 µm.

Material examined. INDIA: Punjab, Kulu valley, Manali, 26 Aug. 1964, C. Bas 4257, on decaying stump in *Cedrus-Picea* forest, c. 2200 m alt. (No. 969.134-074b; L).

The macroscopic description of the species is adapted from the collector's notes, complemented by my own observations on the dried material. The microscopic details are based on reexamination of the collection cited above.

European specimens of *Mycena tintinnabulum* are noted for the thick pellicle covering the pileus, rendering the latter somewhat viscid when wet. This gelatinous layer was not observed in the fresh material, but is easily seen under the microscope. Another difference is that European *tintinnabulum* is known to grow on wood of deciduous trees, whereas the Indian collection was found in a coniferous forest.



Figs. 11–16. *Mycena abietina* (Wating 13081; E). 11. Immature basidium; 12. spores; 13. cheilocystidia; 14. hyphae of the pileipellis; 15. hypha of the cortical layer of the stipe; 16. terminal cells. — Figs. 17–23. *Mycena bathyrrhiza* (Abraham K 1503; K). 17. Habit sketch (by the collector; c. $\times 0.4$); 18. basidia; 19. spores; 20. cheilocystidia (from middle of lamella); 21. cheilocystidia (from near the pileus margin); 22. hyphae of the pileipellis; 23. hypha of the cortical layer of the stipe. (All figures, except Fig. 17, $\times 700$.)

Mycena sect. *Fragilipedes* (Fr.) Quél.

Agaricus [sect.] *Fragilipedes* Fr., Epicr. Syst. mycol. (1838) 108. — *Mycena* [sect.] *Fragilipedes* (Fr.) Quél., Mém. Soc. Emul. Montbél. II 5 (1872) 105. — Lectotype: *Agaricus alcalinus* Fr. sensu Kühn., 1938. For further synonymy, see Maas Geesteranus (1988a: 43).

3. *Mycena abietina* Maas G., spec. nov.¹ — Figs. 11–16

Basidiomata sparsa. Pileus 8–12 mm latus, campanulatus, umbonatus, pruinosis, sulcatus, siccus umbrinus, centro obscurior. Caro tenuis, pileo concolor, odore saporeque ignotis. Lamellae c. 21 stipitem attingentes, molles, adscendentes, c. 1 mm latae, late adnatae, dente decurrentes, albae, margine convexo, concolore. Stipes c. 35×1.5 mm, cavus, aequalis, cylindraceus, minute puberulus, pileo concolor.

Basidia c. 30×9 μm , clavata, 4-sporigera, fibulata. Sporae $9.8\text{--}11.6 \times 5.4\text{--}6.4$ μm , inaequilateraliter ellipsoideae, leves, amyloideae. Cheilocystidia $45\text{--}63 \times 8\text{--}18 \times 3.5\text{--}4.5$ μm , lageniformia, fibulata, levia. Pleurocystidia similia. Hyphae pileipellis $2\text{--}2.7$ μm latae, fibulatae, surculis $2.5\text{--}9 \times 1.3\text{--}1.8$ μm praeditae, haud gelatinosae. Hyphae stipitis corticales $1.3\text{--}3.5$ μm latae, fibulatae, surculis sparsis $2.5\text{--}7 \times 1.8\text{--}2.5$ μm instructae, haud gelatinosae, cellulae terminales c. $45 \times 2.5\text{--}3.5$ μm , surculis $4.5\text{--}20 \times 2\text{--}3.5$ μm munitae.

Ad truncum coniferis muscosum.

Holotypus: '*Mycena* cf. *atrocyanea*', R. Wating 13081 (E).

¹) Etymology: abietinus, applied to cryptogams which grow on firs (or conifers in general).

Basidiomata scattered. Pileus 8–12 mm across, campanulate, with a small umbo, pruinose, sulcate, dark grey-brown, blackish at the centre. Flesh thin, concolorous with the pileus. Odour and taste unknown. Lamellae c. 21 reaching the stipe, tender, ascending, c. 1 mm broad, broadly adnate, decurrent with a short tooth, whitish, with convex, concolorous edge. Stipe c. 35×1.5 mm, hollow, equal, terete, minutely and sparsely puberulous, concolorous with the pileus.

Basidia c. 30×9 μm , clavate, a few seen with four incipient sterigmata, clamped. Spores $9.8\text{--}11.6 \times 5.4\text{--}6.4$ μm , pip-shaped, smooth, amyloid. Cheilocystidia $45\text{--}63 \times 8\text{--}18 \times 3.5\text{--}4.5$ μm , forming a sterile band (lamellar edge homogeneous), lageniform, stalked or not, clamped, smooth, at times with a furcate neck. Pleurocystidia similar, infrequent. Lamellar trama brownish vinescent in Melzer's reagent. Hyphae of the pileipellis $2\text{--}2.7$ μm wide, clamped, not gelatinized, at first covered with widely spaced, simple, straight to curved or flexuous, cylindrical excrescences $2.5\text{--}9 \times 1.3\text{--}1.8$ μm , but finally very densely diverticulate. Hyphae of the cortical layer of the stipe $1.3\text{--}3.5$ μm wide, clamped, not gelatinized, sparsely covered with simple, cylindrical excrescences $2.5\text{--}7 \times 1.8\text{--}2.5$ μm , the terminal cells c. $45 \times 2.5\text{--}3.5$ μm , cylindrical, covered with fairly few, widely spaced, somewhat curved or flexuous excrescences $4.5\text{--}20 \times 2\text{--}3.5$ μm .

On moss-covered coniferous log.

Holotype: 'Flora of Kashmir-India / *Mycena* cf. *atrocyanea* / Gulmarg / 28 Sept. 1978 / Roy Watling 13081 / 6000 ft' (E).

Both the macroscopic description and the microscopic details are based on reexamination of the dried type material. The species is a member of section *Fragilipedes*.

Watling (apud Watling & Gregory, 1980: 556) doubtfully identified his collection with *Mycena atrocyanea* (Fr.) Gillet, and from his letter (June 1991) it becomes clear that *M. atrocyanea* sensu A.H. Smith was meant. The latter proved to be a new species and was subsequently described as *Mycena coracina* (Maas Geesteranus, 1988a: 69). Although no information is available on the colours of *M. abietina* in the fresh condition, it is not difficult to see that this species differs from *M. coracina*. Its stipe does not in the least give the impression of having been 'rigid and cartilaginous' as was stated for *M. atrocyanea* sensu Smith (1947: 255), but it may have been firm when fresh. In *M. abietina*, the spores ($5.4\text{--}6.4$ μm broad) are narrower than those of *M. coracina* ($6.3\text{--}7.2$ μm), the cheilocystidia are longer ($45\text{--}63$ μm) than those of *M. coracina* ($27\text{--}45$ μm), while the terminal cells of the hyphae of the cortical layer of the stipe of *M. abietina* with their long, pennant-like excrescences look very different indeed. If it is assumed that the stipe of Watling's material was fragile when fresh, three further species should be considered: *Mycena abramsii* (Murrill) Murrill, *M. alnicola* A.H. Smith, and *M. subcana* A.H. Smith. Careful perusal of the pertinent descriptions, however, show all three to be different from *M. abietina*.

4. *Mycena bathyrrhiza* Maas G., spec. nov.² — Figs. 17–23

Basidiomata congregata. Pileus > 20 mm latus, conico-campanulatus, sulcatus, pruinosis, glabrescens, griseus (siccatus fuscus), margine concolor. Caro tenuis, pallida, odore saporisque ignotis. Lamellae c. 20 stipitem attingentes, molles, adscendentes, usque ad 1.5 mm latae, anguste adnatae, albae, basi gri-

2) Etymology: βάθος, deep; ῥίζα, root.

seae, margine albae. Stipes 50(–80) × 5 mm, cavus, fragilis, aequalis, cylindraceus, apice minute pruinosis, deorsum glaber, levis, murinus, basi longe radicans, fibrillis albis munitus.

Basidia (immatura) 30–36 × 7–9 µm, clavata, 2-(3-)sporigera, efibulata, sterigmatibus 6.5–7 µm longis praedita. Sporae 9.0–11.6 × 5.8–7.2 µm, inaequilateraliter ellipsoideae, leves, amyloideae. Cheilocystidia 27–60 × 10–16 × 5.5–8 µm, lageniformia, subclavata, subfusiformia, efibulata, levia vel apice furcata, pilei marginem versus surculis varieformibus instructa. Pleurocystidia nulla. Trama lamellarum iodi ope brunneo-vinescens. Hyphae pileipellis 2.7–4.5 µm latae, efibulatae, surculis 1.8–8 × 1.5–1.8 µm, simplicibus vel ramosis praeditae. Hyphae stipitis corticales 1.8–3.5 µm latae, efibulatae, surculis 2.5–3.5 × 1.5–1.8 µm instructae.

Ad arborem putridum.

Holotypus: *S.P. Abraham K 1503* (K).

Basidiomata in groups. Pileus > 20 mm across, conico-campanulate, sulcate, pruinose, glabrescent, greyish (fairly dark fuscous in the dried material), concolorous at the margin. Flesh thin, pallid. Odour and taste not recorded. Lamellae c. 20 reaching the stipe, tender, ascending, up to 1.5 mm broad, narrowly adnate ('adnexed' according to the collector), white, more greyish at the base, edge straight to shallowly convex, white. Stipe 50(–80) × 5 mm, hollow, fragile, equal, terete, apically minutely pruinose, glabrous farther below, smooth, mouse-greyish, the base extending into a long root, covered with white fibrils.

Basidia (immature) 30–36 × 7–9 µm, fairly slender-clavate, 2-spored, occasionally 3-spored, clampless, with sterigmata 6.5–7 µm long. Spores 9.0–11.6 × 5.8–7.2 µm, broadly pip-shaped, smooth, amyloid. Cheilocystidia 27–60 × 10–16 × 5.5–8 µm, forming a sterile band (lamellar edge homogeneous), lageniform, more infrequently subclavate or subfusiform, clampless, smooth or apically furcate (in the middle of the lamella) to apically more or less branched or covered with coarse, variously shaped and branched, excrescences 6–15 × 2–5 µm (near the margin of the pileus). Pleurocystidia absent. Lamellar trama brownish vinctous in Melzer's reagent. Hyphae of the pileipellis 2.7–4.5 µm wide, clampless, covered with (somewhat gelatinized?) fairly coarse, simple to furcate or branched excrescences 1.8–8 × 1.5–1.8 µm. Hyphae of the cortical layer of the stipe 1.8–3.5 µm wide, clampless, covered with simple, straight to somewhat curved excrescences 2.5–3.5 × 1.5–1.8 µm.

On decayed stumps.

Holotype: '[as *Mycena alcalina*] India, Jammu & Kashmir, Pahalgam / 22 June 1987 / *S.P. Abraham K 1503*' (K).

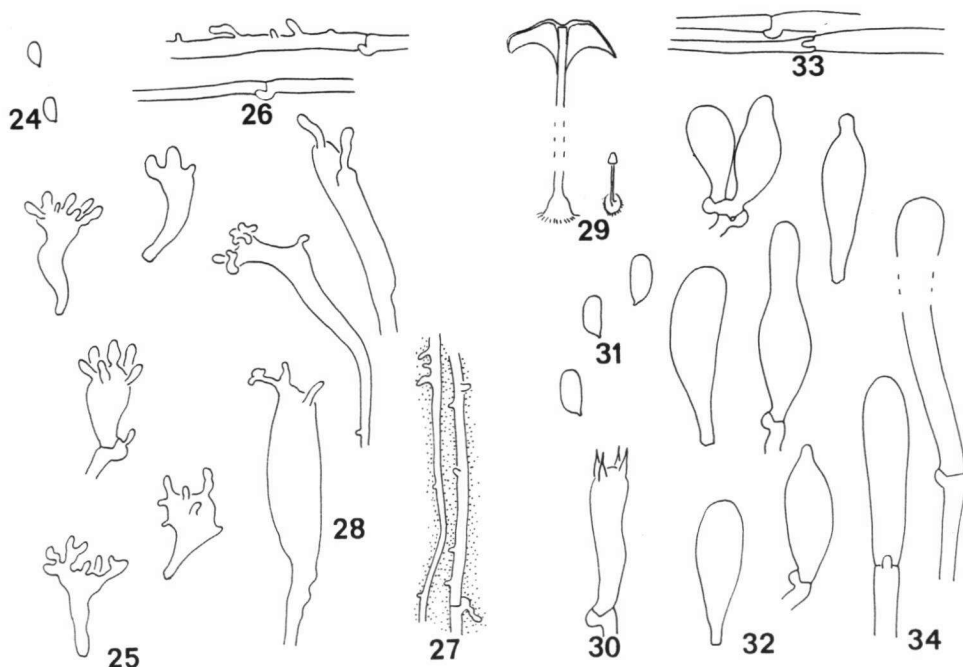
The macroscopic description of the species is adapted from the collector's notes, complemented by my own observations on the dried material. The microscopic details are based on reexamination of the type.

Mycena bathyrrhiza is a member of section *Fragilipedes*, distinct from any species thus far known in the Northern Hemisphere, and equally different from any 'Sikkim Himalaya' *Mycenas* described by Berkeley (1850, 1852).

5. *Mycena coalita* Maas G., *spec. nov.*³ — Figs. 24–28

Basidiomata fasciculata. Pileus 11–18 mm latus, plane conicus, subumbonatus, haud lubricus, levis, translucens striatus, glaber, pallide argillaceus, marginem versus pallidior. Caro tenuis, albida, odore chlorino, sapore haud distincto. Lamellae 22–27 stipitem attingentes, molles, adscendentes, usque ad

3) Etymology: *coalitus*, joined together.



Figs. 24–28. *Mycena coalita* (Bas 4369; L). 24. Spores; 25. cheilocystidia; 26. hyphae of the pileipellis; 27. hyphae of the cortical layer of the stipe; 28. terminal cells. — Figs. 29–34. *Mycena cinnabarina* (Bas 4361; L). 29. Habitus of young specimen and section of old specimen (dried); 30. basidium; 31. spores; 32. cheilocystidia; 33. hyphae of the pileipellis; 34. terminal cells of hyphae of the cortical layer of the stipe. (Fig. 29, $\times 2$; all others, $\times 700$.)

2 mm latae, late adnatae, dente decurrentes, pallide cremeo-argillaceae roseo-tinctae. Stipes 50–75 \times 0.8–1.5 mm, cavus, fragilis, aequalis, cylindraceus, apice floccoso-pruinosis, deorsum glaber, levis, pallide cremeus brunneolotinctus, basi radicans, fibrillis pallidis dense instructus.

Basidia (immatura) c. 18 \times 5.5 μ m, clavata, 4-sporigera, fibulata. Sporae 4.9–5.4 \times 2.4–2.8 μ m, inaequilateraliter ellipsoideae, leves, amyloideae. Cheilocystidia 14.5–22.5 \times 6.5–10 μ m, clavata, fibulata, surculis crassis 3.5–8 \times 1.5–3 μ m munita. Pleurocystidia sparsa, similia. Trama lamellarum iodi ope plus minusve rubro-brunnea. Hyphae pileipellis 2.5–4.5 μ m latae, fibulatae, leves vel surculis sparsis praeditae, haud gelatinosae. Hyphae stipitis corticales 1.5–2.5 μ m latae, fibulatae, maxima ex parte leves, materiam gelatinosam immersae, cellulae terminales 5.5–10.5 μ m latae, apicibus diverticulatis.

In nemore frondoso.

Holotypus: C. Bas 4369 (No. 964.289-279; L).

Basidiomata fasciculata. Pileus 11–18 mm across, shallowly conical, with little pronounced or centrally somewhat depressed umbo, not lubricous, smooth, translucent-striate, glabrous, pale beige to beige-brown at the centre, very pale beige at the margin. Flesh thin, watery whitish. Odour chlorine-like, more pronounced when crushed. Taste indistinct. Lamellae 22–27 reaching the stipe, tender, ascending, becoming almost horizontal, up to 2 mm broad, broadly adnate, decurrent with a tooth, very pale creamy beige with some pinkish tint, the edge shallowly convex to straight, concolorous. Stipe 50–75 \times 0.8–1.5 mm, hollow, fragile, equal, terete, apically sparsely floccose-pruinose, glabrous and polished farther below, watery pale cream with some brownish tint, in the

end becoming pale brownish, the base rooting, dull brown, densely covered with long, coarse, whitish fibrils.

Basidia (none seen mature) c. $18 \times 5.5 \mu\text{m}$, clavate, with 4 incipient sterigmata, clamped. Spores $4.9\text{--}5.4 \times 2.4\text{--}2.8 \mu\text{m}$, pip-shaped, smooth, amyloid. Cheilocystidia $14.5\text{--}22.5 \times 6.5\text{--}10 \mu\text{m}$, forming a sterile band (lamellar edge homogeneous), clavate to more or less irregularly shaped, clamped, covered with fairly few, unevenly spaced, coarse, simple to furcate, cylindrical to more or less inflated excrescences $3.5\text{--}8 \times 1.5\text{--}3 \mu\text{m}$. Pleurocystidia scarce, similar. Lamellar trama staining somewhat reddish-brownish in Melzer's reagent. Hyphae of the pileipellis $2.5\text{--}4.5 \mu\text{m}$ wide, clamped, smooth or sparsely covered with cylindrical excrescences $2\text{--}6.5 \times 1\text{--}2 \mu\text{m}$, not gelatinized. Hyphae of the cortical layer of the stipe $1.5\text{--}2.5 \mu\text{m}$ wide, clamped, somewhat embedded in gelatinous matter, smooth for the greater part, terminally with scattered warts or short cylindrical excrescences $1\text{--}2.5 \times 1\text{--}1.5 \mu\text{m}$, terminal cells infrequent, $5.5\text{--}10.5 \mu\text{m}$ wide, cylindrical to more or less inflated, apically with variously shaped, simple to branched excrescences.

In forest of *Quercus incana*-*Rhododendron arboreum*.

Holotype: 'Fungi of India / *Mycena coalita* Maas G. / Uttar Pradesh, Mussoorie, near Charlesville / 13 Sept. 1964 / C. Bas 4369 / c. 2000 m alt., growing from under a rock' (No. 964.289-279; L).

The macroscopic description of this member of section *Fragilipedes* is adapted from the collector's notes, complemented by my own observations on the dried material. The microscopic details are based on reexamination of the type.

The slightly pinkish-tinted lamellae and the short, coarsely diverticulate cheilocystidia of the present species may remind one of *Mycena pseudo-inclinata* A.H. Smith, a species of North America (Maas Geesteranus, 1988b: 155). This species, however, has a differently coloured pileus, a subfarinaceous odour, a dry stipe, and bigger spores.

Berkeley (1852: 101) described an *Agaricus colligatus* from Sikkim which, like *Mycena coalita*, is characterized by caespitose habit, pale pileus, and narrow, nearly white lamellae. But a glance at the cheilocystidia of *A. colligatus* (Maas Geesteranus, 1982: 528) and the fact that its lamellae are truly arcuate quickly learn that this species must be different from *Mycena coalita*.

Mycena sect. *Hygrocyboideae* (Fr.) Sing.

Agaricus [sect.] *Hygrocyboideae* Fr., Syst. mycol. 1 (1821) 155. — *Mycena* sect. *Hygrocyboideae* (Fr.) Sing., Beih. Sydowia 7 (1973) 49. — Lectotype: *Mycena epipterygia* (Scop.: Fr.) S.F. Gray.

For further synonymy, see Maas Geesteranus (1989a: 89).

Berkeley (1852: 103) recorded *Agaricus epipterygius* from Sikkim and cited Hooker's numbers 9 and 17. In both collections the tissues are badly collapsed, they differ from each other and neither represents *Mycena epipterygia*.

Mycena sect. *Calodontes* (Fr. ex Berk.) Quél.

Agaricus subtrib. *Calodontes* Fr., Syst. mycol. 1 (1821) 111. — *Agaricus* [sect.] *Calodontes* Fr. ex Berk., J.E. Smith, Engl. Flora 5 (2) (1836) 43. — *Mycena* [sect.] *Calodontes* (Fr. ex Berk.) Quél., Mém. Soc. Emul. Montbél. II 5 (1872) 102. — Lectotype: *Agaricus pelianthinus* Fr.

For further synonymy, see Maas Geesteranus (1989b: 480).

Mycena sect. Calodontes subsect. Marginatae J.E. Lange

Mycena sect. *Ciliatae* [subsect.] *Marginatae* J.E. Lange, Dansk bot. Ark. 1 (5) (1914) 13, 18. — Lectotype: *Mycena pelianthina* (Fr.) Quél.

For further synonymy, see Maas Geesteranus (1989b: 481).

6. *Mycena cinnabarina* Maas G., spec. nov.⁴ — Figs. 29–34

Basidiomata sparsa. Pileus 5–12 mm latus, campanulatus, convexus vel plano-convexus, centro applanatus vel depressus, siccus vel sublubicus, initio levis, deinde sulcatus, translucente striatus, glaber, hygrophanus, cinnabarinus, centro obscurior, atratus, siccus pallidior, centro ochraceo-roseus. Caro tenuis, pileo concolor, odore saporeque raphanoideis. Lamellae 15–21 stipitem attingentes, molles, adscendentes, usque ad 1.5 mm latae, late adnatae, decurrentes, roseae, margine concavo, cinnabarino. Stipes 13–58 × 0.2–0.7 mm, fistulosus, fragilis, aequalis, cylindraceus, apice minute sparseque puberulus, deorsum glaber, levis, lubricus, pileo concolor, basi bulbosus roseo-tomentosus.

Basidia 22.5–24 × 6.5–7 µm, clavata, 4-sporigera, fibulata, sterigmatibus 5.5 µm longis praedita. Sporae 6.7–8.1 × 3.6–4.2 µm, inaequilateraliter ellipsoideae, leves, amyloideae. Cheilocystidia 22.5–35 × 6.5–10 µm, clavata, fusiformia, lageniformia, fibulata, pigmento rubro repleta, levia. Pleurocystidia similia. Hyphae pileipellis 2.5–4.5 µm latae, fibulatae, leves. Hyphae stipitis corticales 2.5–3.5 µm latae, fibulatae, leves, cellululae terminales 30–80 × 6.5–13.5 µm, clavatae, subcylindraceae, fibulatae, leves.

Ad *Quercus incanae* folia dejecta.

Holotypus: C. Bas 4361 (No. 964.298-385; L).

Basidiomata scattered. Pileus 5–12 mm across, at first campanulate, then convex to plano-convex, at the centre becoming flattened or depressed, dry or somewhat lubricous, smooth when young, later sulcate, glabrous, translucent-striate, hygrophanous, fresh deep cinnabar red, darker at the centre to almost blackish, on drying becoming much paler, with ochraceous-pink centre. Flesh thin, concolorous with the pileus. Odour weak but raphanoid when crushed. Taste raphanoid. Lamellae 15–21 reaching the stipe, tender, ascending, up to 1.5 mm broad, broadly adnate and decurrent, smooth, occasionally intervenose, reddish pink, the edge concave, dark cinnabar red. Stipe 13–58 × 0.2–0.7 mm, hollow, fragile, equal, terete, more or less curved, smooth, apically minutely and sparsely puberulous, glabrous farther below, lubricous, concolorous with the pileus, the base bulbous and covered with pinkish tomentum

Basidia 22.5–24 × 6.5–7 µm, clavate, 4-spored, clamped, with sterigmata 5.5 µm long. Spores 6.7–8.1 × 3.6–4.2 µm, pip-shaped, smooth, amyloid. Cheilocystidia 22.5–35 × 6.5–10 µm, forming a sterile band (lamellar edge homogeneous), clavate, fusiform, lageniform, clamped, with red contents, smooth. Pleurocystidia similar. Hyphae of the pileipellis 2.5–4.5 µm wide, clamped, with red contents, smooth. Hyphae of the cortical layer of the stipe 2.5–3.5 µm wide, clamped, with red contents, smooth, the terminal cells 30–80 × 6.5–13.5 µm, clavate to subcylindrical, clamped, with red contents (?), smooth.

Growing on fallen leaves of *Quercus incana*.

Holotype: 'Fungi of India / *Mycena cinnabarina* Maas G. / Uttar Pradesh, Mussoorie near Charlesville / 13 Sept. 1964 / C. Bas 4361 / c. 2000 m alt.' (No. 964. 298-385; L).

4) Etymology: cinnabarinus, vermilion.

The macroscopic description of the species is adapted from the collector's notes, complemented by my own observations on the dried material. The microscopic details are based on reexamination of the type.

All essential characters identify *Mycena cinnabarina* as a species of section *Calodontes* (Fr. ex Berk.) Quél. subsect. *Marginatae* J.E. Lange, but two features separate it from other members of the subsection. One of the differences is that the base of the stipe of *M. cinnabarina* is swollen to form a conspicuous bulb. The other, even more striking, difference is in the presence of copious red pigment inside all surface hyphae of pileus and stipe. Probably some of this matter is also excreted on the outside of the hyphal walls which may explain the lubricous feel of pileus and stipe noted by the collector. Under the microscope, however, no gelatinization of the hyphal walls was observed. The red contents of the surface hyphae, dissolving in a dark violet cloud in diluted KOH, is so concentrated as to render it difficult to check whether or not this matter also occurs in the hyphae of the tramal tissues. It is equally difficult to observe whether the lamellar trama stains a purplish colour in Melzer's reagent.

Red is not a colour commonly seen in *Mycena*, so any red species lacking important details in its original description will require scrutiny. Some examples follow here.

From Darjeeling in India and at an elevation only a little higher than that of Mussoorie, Berkeley (1850: 79) described *Agaricus (Mycena) rubiaetinctus*, a fungus almost as red as *Mycena cinnabarina*, and thus requiring a closer look. It can be told from *M. cinnabarina* by its lamellae (which are free), its apparent lack of pleurocystidia (Maas Geesteranus, 1982: 535), its longer cheilocystidia (55–65 μm), and its different habitat (on trunks of trees).

An orange to red species of *Mycena* is known from Java as *Mycena subacicula* P. Henn. (Hennings, 1900: 157). It is easily distinguishable from *M. cinnabarina* on account of its small number of lamellae (eight reaching the stipe) and its subglobose spores (stated to measure 3.5 μm).

Mycena fuyoensis Imai (Imai, 1941: 448) attracts the attention on account of its red pileus, but the species probably is a member of section *Adonideae* (Maas Geesteranus, 1991b: 401) rather than subsection *Marginatae*.

Mycena aurantiorubra Métrod (1949: 88) described from Madagascar can be told from *M. cinnabarina* by its narrow lamellae with apparently concolorous edges, thick-walled cheilocystidia, and diverticulate hyphae of the pileipellis.

Mycena praeclara Horak (1978: 23), although not considered a member of *Mycena* as I see this genus, may be briefly mentioned on account of its orange-red pileus. Its hymeniform pileipellis separates it at once from *M. cinnabarina*.

Stevenson (1964: 48) described a *Mycena minirubra* from New Zealand which, to judge from the somewhat meagre data supplied, could well be a member of subsection *Marginatae*, too. It differs from *M. cinnabarina* in having a much smaller pileus (0.5–1 mm across; *cinnabarina*: 5–12 mm), apricot lamellae (*cinnabarina*: reddish pink), a much shorter stipe (3–5 mm; *cinnabarina*: 13–58 mm), and a white basal disc (*cinnabarina*: basal part of the stipe bulbous and covered with pinkish tomentum).

Yet another red species from New Zealand described by the same author (Stevenson, 1964: 54) is *Mycena miniata* (a later homonym, not *M. miniata* Petch, 1917) which can be separated from *M. cinnabarina* by its non-decurrent lamellae, lack of a bulbous swelling at the base of the stipe, more broadly pip-shaped spores (8 \times 6 μm), and awl-shaped cheilocystidia.

Mycena sect. Calodontes subsect. *Puræ* (Konr. & Maubl.) Maas G.

Mycena sect. *Puræ* Konr. & Maubl., Ic. sel. Fung. 6 (1934) 269. — *Mycena* sect. *Calodontes* subsect. *Puræ* (Konr. & Maubl.) Maas G., Persoonia 11 (1980) 112. — Lectotype: *Mycena pura* (Pers.: Fr.) Kummer.

For further synonymy, see Maas Geesteranus (1989b: 488).

Subsection *Puræ* is a group of species characterized by pronounced colours ranging from pink and purple to violet and blue, but it should not be taken for granted that every pink-capped fungus belongs to the *Puræ*. *Agaricus bicrenatus* is a case in point. Berkeley (1850: 79) described this species as "of a delicate pinkish white, with deeper shades on the apex of the pileus." He terminated by stating that "The colours are nearly those of *A. purus*." Manjula (1983: 86, 87) who has studied the type concluded that *Agaricus bicrenatus* "belongs to the section *Puræ* Konrad and Maubl. and is close to *M. pura* ...," although he had to admit that "the microstructures could not be observed." I adhere to my former view (Maas Geesteranus, 1982: 529) that the taxonomic identity of Berkeley's species is unknown.

7. *Mycena pura* (Pers.: Fr.) Kummer f. *pura* — Figs. 35–38

Agaricus purus Pers., Neues Mag. Bot. (1794) 101; Fr., Syst. mycol. 1 (1821) 151. — *Mycena pura* (Pers.: Fr.) Kummer, Führ. Pilzk. (1871) 107, 110. — Type locality: Germany.

For further synonymy, see Maas Geesteranus (1989b: 494).

Basidiomata scattered. Pileus 15–22 mm across, shallowly conical to planoconvex, sometimes with small umbo, smooth, translucent-striate, glabrous, not lubricous, very pale lilaceous pink to pale violet-grey, paler towards the margin. Flesh thin, concolorous with the pileus. Odour and taste strongly raphanoid when crushed. Lamellae 22–26 reaching the stipe, tender, at first ascending, becoming more horizontal with age, up to almost 3 mm broad, thin, adnate or somewhat decurrent with a short tooth, smooth, dorsally intervenose, very pale lilaceous pink to somewhat greyed lilaceous cream, the edge shallowly convex, concolorous. Stipe 45–75 × 1.5–2.2 mm, hollow, equal for the greater part, broadened below, straight, curved near the base, terete, smooth, pruinose above, glabrous farther down, pale grey violaceous pink to very pale lilaceous pink, the base covered with few, coarse fibrils.

Basidia (none seen mature) 20–22.5 × 5.5–6.5 µm, clavate, 4-spored, clamped, with sterigmata c. 3.5 µm long. Spores 7.6–9.0 × 3.6–4.5 µm, pip-shaped, smooth, amyloid. Cheilocystidia 40–63 × 9–20 µm, forming a sterile band (lamellar edge homogeneous), fusiform, subclavate, short- to long-stalked, clamped, smooth, apically broadly rounded. Pleurocystidia fairly numerous, similar. Lamellar trama brownish vinescent in Melzer's reagent. Hyphae of the pileipellis 3.5–10 µm wide, clamped, smooth, not gelatinized. Hyphae of the cortical layer of the stipe 1.8–2.7 µm wide, clamped, smooth, terminal cells (caulocystidia) 8–12.5 µm wide, fusiform, smooth.

Material examined. INDIA: Uttar Pradesh, Mussoorie, Oakville, 16 Sept. 1964, C. Bas 4404, in forest of *Quercus incana* and *Rhododendron arborea*, with scattered *Cedrus deodara*, c. 2300 m alt. (No. 965.11-092; L).

The macroscopic description of the species is adapted from the notes accompanying collection Bas 4404. The microscopic details are based on reexamination of this dried material.

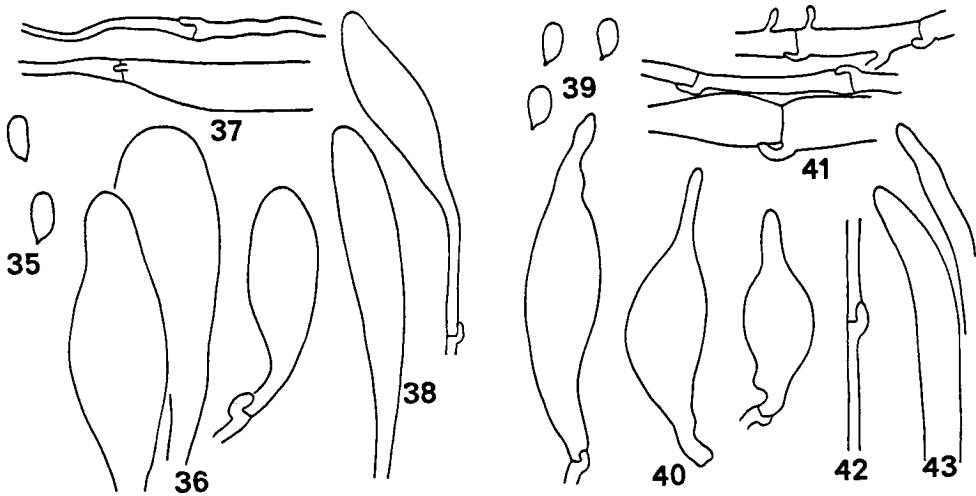


Fig. 35–38. *Mycena pura* f. *pura* (Bas 4404; L). 35. Spores; 36. cheilocystidia; 37. hyphae of the pileipellis; 38. terminal cells of hyphae of the cortical layer of the stipe. — Figs. 39–43. *Mycena gentilis* (Bas 4288; L). 39. Spores; 40. cheilocystidia; 41. hyphae of the pileipellis, overlying a hypha of the hypoderm; 42. hypha of the cortical layer of the stipe; 43. terminal cells. (All figures, $\times 700$.)

Hooker's collection [Ser. 2] No. 28 from Sikkim which Berkeley (1852: 101) considered to represent *Agaricus purus* is not this species. None of the few spores observed prove to be amyloid, which excludes the species of subsection *Purae*. The hyphae of the cortical layer of the stipe appear to be smooth, but it is impossible to demonstrate the presence of caulocystidia, while the lamellar trama is inamyloid. This excludes subsection *Violacellae*. Lacking information on the cheilocystidia, further identification is not possible.

Mycena sect. *Calodontes* subsect. *Violacellae* Sing. ex Maas G.

Mycena stirps *Violacellae* Sing., Agar. mod. taxon., 3rd ed. (1975) 395. — *Mycena* sect. *Calodontes* subsect. *Violacellae* Sing. ex Maas G., Persoonia 11 (1980) 112. — Lectotype: *Mycena violacella* (Speg.) Sing.

8. *Mycena gentilis* Maas G., spec. nov.⁵ — Figs. 39–43

Basidiomata sparsa. Pileus 11–20 mm latus, plano-convexus, udus sublubricus, initio levis, postea subsulcatus, translucente striatus, glaber, hygrophanus, lilaceo-roseus, centro obscure vinaceo-brunneus, siccus pallidior. Caro tenuis, pileo concolor sed pallidior, odore saporeque raphanoideis. Lamellae 21–24 stipitem attingentes, molles, adscendentes, usque ad 3.5 mm latae, late adnatae, dente decurrentes, pallide lilaceo-roseae, margine convexo, pallidiore. Stipes 35–52 \times 1–3 mm, cavus, fragilis, aequalis, cylindraceus, apice minute pruinosis, deorsum glaber, levis, siccus, pallide lilaceo-roseus, apice initio obscure purpureus, basi albidus vel pallide flavo-brunneus, fibrillis sparsis pallidisque instructus.

⁵) Etymology: *gentilis*, of the same tribe, alluding to the affinity with *M. pearsoniana*.

Basidia (immatura) $20\text{--}22.5 \times 5.5\text{--}6.5\ \mu\text{m}$, clavata, 4-sporigera, fibulata, sterigmatibus c. $3.5\ \mu\text{m}$ longis munita. Sporae $6.3\text{--}7.3 \times 4.0\text{--}4.7\ \mu\text{m}$, inaequilateraliter ellipsoideae, leves, inamyloideae. Cheilocystidia $30\text{--}60 \times 10\text{--}18 \times 2\text{--}3.5\ \mu\text{m}$, fusiformia, fibulata, levia. Pleurocystidia nulla. Trama lamellarum iodi ope brunneovinescens. Hyphae pileipellis $2.5\text{--}5.5\ \mu\text{m}$ latae, fibulatae, leves vel surculis sparsis praeditae, haud gelatinosae. Hyphae stipitis corticales $2\text{--}3.5\ \mu\text{m}$ latae, fibulatae, leves, cellulae terminales $3.5\text{--}9\ \mu\text{m}$ latae, cylindraceae.

In Pineto.

Holotypus: *C. Bas 4288* (No. 964.264-087; L).

Basidiomata scattered. Pileus 11–20 mm across, plano-convex, with age centrally somewhat depressed, somewhat lubricous when moist, at first smooth, later slightly sulcate, translucent-striate, glabrous, hygrophanous, vinaceous lilac-pink, at the centre dark vinaceous brown, pallescent with age, with the centre more ochraceous brownish. Flesh thin, paler concolorous with the pileus. Odour somewhat aromatic with raphanoid component. Taste strongly raphanoid. Lamellae 21–24 reaching the stipe, tender, ascending, becoming almost horizontal, up to 3.5 mm broad, thin, broadly adnate, decurrent with a tooth, smooth, dorsally intervenose, pale lilac-pink, the edge shallowly convex to straight, paler than the sides. Stipe $35\text{--}52 \times 1\text{--}3\ \text{mm}$, hollow, fragile, equal, terete, apically delicately pruinose, glabrous farther below, smooth, dry, pale lilac-pink but apically dark purplish when young, the base whitish or pale brownish yellow, sparsely covered with pallid fibrils.

Basidia (none seen mature) $20\text{--}22.5 \times 5.5\text{--}6.5\ \mu\text{m}$, clavate, 4-spored, clamped, with sterigmata c. $3.5\ \mu\text{m}$ long. Spores $6.3\text{--}7.3 \times 4.0\text{--}4.7\ \mu\text{m}$, pip-shaped, smooth, non-amyloid. Cheilocystidia $30\text{--}60 \times 10\text{--}18 \times 2\text{--}3.5\ \mu\text{m}$, fusiform with much narrowed apices, clamped, smooth. Pleurocystidia absent. Lamellar trama brownish vinescent in Melzer's reagent. Hyphae of the pileipellis $2.5\text{--}5.5\ \mu\text{m}$ wide, clamped, smooth for the greater part but with occasional cylindrical excrescences $1\text{--}2\ \mu\text{m}$ wide, neither gelatinized nor overlying gelatinous matter covering the hypoderm. Hyphae of the cortical layer of the stipe $2\text{--}3.5\ \mu\text{m}$ wide, clamped, smooth, the terminal cells $3.5\text{--}9\ \mu\text{m}$ wide, cylindrical.

Found in a plantation of *Pinus roxburghii*.

Holotype: 'Fungi of India / *Mycena gentilis* Maas G. / Uttar Pradesh, Dehra Dun, New Forest / 5 Sept. 1964 / *C. Bas 4288* / c. 600 m alt.' (No. 964.264-087; L).

The macroscopic description of the species is adapted from the collector's notes, complemented by my own observations on the dried material. The microscopic details are based on reexamination of the type.

The specific epithet has been chosen in view of the resemblance to *Mycena pearsoniana*, with which the specimens were doubtfully identified in the field. However, *Mycena gentilis* differs from *M. pearsoniana* in (1) the shorter spores ($7.2\text{--}9.0\ \mu\text{m}$ in European material of *M. pearsoniana*), (2) the conspicuously narrowed apices of the cheilocystidia, and (3) the absence of gelatinous matter covering the hypoderm. The pallid base of the stipe of *M. gentilis* may prove to be yet another differential character.

Mycena auricolor (Berk. & Br.) Petch as redescribed by Pegler (1986: 198) has the pale pink colours in common with *M. gentilis* but differs in being a member of subsection *Purae* (Konr. & Maubl.) Maas G., characterized among other features by amyloid spores.

Mycena sect. Hiemales Konr. & Maubl.

Mycena [sect.] *Hiemales* Konr. & Maubl., Ic. sel. Fung. 6 (1934) 274. — Lectotype: *Marasmiellus hiemalis* (Osb. apud Retz.) Sing.

For further synonymy, see Maas Geesteranus (1991a: 81).

Mycena sect. Hiemales subsect. Hiemales Maas G.

Mycena sect. *Hiemales* subsect. *Hiemales* Maas G., Persoonia 11 (1980) 114. — Type species: *Mycena hiemalis* (Osb. apud Retz.) Quél.

For further synonymy, see Maas Geesteranus (1991a: 82).

9. *Mycena olida* Bres. — Figs. 44–49

Mycena olida Bres., Fungi trid. 1 (1887) 73, pl. 79 fig. 1.; Icon. mycol. 5 (1928) pl. 240 fig. 1. — *Marasmiellus olidus* (Bres.) Sing., Lilloa 22 (1951 ['1949']) 302. — Holotype in S.

For further synonymy, see Maas Geesteranus (1991a: 86).

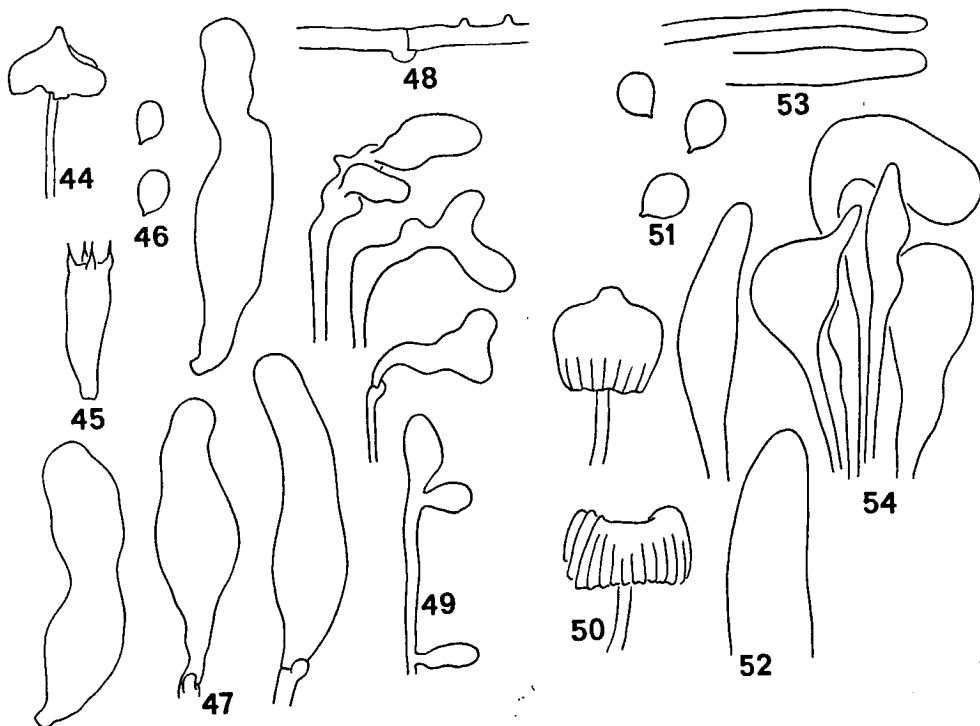
Basidiomata scattered. Pileus 3.5–8 mm across, parabolical to campanulate, with small, acute umbo, not sulcate, translucent-striate, glabrous, not lubricous, ivory white to somewhat brownish, with concolorous margin. Flesh thin, watery concolorous. Odour and taste indistinctive. Lamellae 14–16 reaching the stipe, tender, ascending, up to 2 mm broad, thin, narrowly adnate, smooth, white, the edge convex, concolorous. Stipe 22–32 × 0.4–0.6 mm, hollow, equal, straight, curved below, terete, smooth, pruinose to minutely puberulous all over, watery white to cream, the base covered with long, coarse, white fibrils.

Basidia (few seen mature) c. 22.5 × 7–8 µm, clavate, 4-spored, clamped, with sterigmata 4.5–5.5 µm long. Spores 6.3–7.2 × 4.9–6.0 µm, fairly broadly pip-shaped, smooth, inamyloid. Cheilocystidia 46–52 × 8–15 × 5.5–11.5 µm, occurring mixed with the basidia (lamellar edge heterogeneous), fusiform, irregularly subcylindrical, clamped, smooth, apically broadly rounded. Pleurocystidia similar. Lamellar trama not vinctose in Melzer's reagent. Hyphae of the pileipellis 2.7–5 µm wide, clamped, smooth except for a few isolated wart-like excrescences. Hyphae of the cortical layer of the stipe 1.5–2.5 µm wide, clamped, smooth, terminal cells (caulocystidia) 22–50 × 5.5–9 µm, clavate, simple or lobed to somewhat branched, smooth.

Material examined. INDIA: Uttar Pradesh, between Mussoorie and Balansar, 22 Sept. 1964, *C. Bas 4457*, on moss-covered base of *Quercus incana*, c. 1800 m alt. (No. 965.11-019; L).

The macroscopic description of the species is adapted from the notes accompanying collection *Bas 4457*, complemented by my own observations on the dried specimens. The microscopic details are based on reexamination of this material.

My assumption that the four-spored form of *M. olida* would possess clamps (Maas Geesteranus, 1991a: 88) is confirmed by the present material. Mr. Th. Münzmay, a correspondent in Dormagen (Germany), asserted in a recently received letter that he found the four-spored form in his surroundings to be more common than the two-spored form.



Figs. 44–49. *Mycena olida* (Bas 4457). 44. Habitus; 45. basidium; 46. spores; 47. cheilocystidia; 48. hypha of the pileipellis; 49. caulocystidia. — Figs. 50–54. *Hydropus eburneus* (Bas 4147). 50. Habitus of young specimen (with umbo) and old one (with the centre depressed); 51. spores; 52. cheilocystidia; 53. hyphae of the pileipellis; 54. caulocystidia. (Fig. 44, $\times 2.5$; Fig. 50, $\times 3$; all others, $\times 700$.)

HYDROPUS Kühn. ex Sing.

Mycena, unnamed group *Hydropus* Kühn., Genre *Mycena*: (1938) 531 (not validly publ.). — *Hydropus* Kühn. ex Sing., Pap. Mich. Acad. Sci. 32 (1946) 127. — Type species: *Agaricus fuliginarius* Batsch.

10. *Hydropus eburneus* Maas G., *spec. nov.*⁶ — Figs. 50–54

Basidiomata sparsa. Pileus 12–17 mm latus, obovoideus, parabolicus, e umbonato planoconvexus vel subdepressus, initio subviscidus, demum siccus, centro subsquamulosus, marginem versus fibrillosus, sulcatus, translucente striatus, subhygrophanus, udus eburneus, centro brunneus. Caro tenuis, pallida, odore saporeque tenuibus. Lamellae c. 23 stipitem attingentes, molles, adscendentes, vix 1 mm latae, liberae vel anguste adnatae, albae vel dilute brunneolae, margine convexo concolore. Stipes 18–32 \times 0.7–1.5 mm, cavus, aequalis, cylindraceus, apice minute pruinoso-flocculosus, albus vel subeburneus, basi incrassatus?

Basidia c. 25 \times 7 μ m, clavata, 4-sporigera, fibulata, sterigmatibus 4.5 μ m longis instructa. Sporae 6.7–8.1 \times 5.8–7.1 μ m, globosae vel subglobosae, leves, amyloideae. Cheilocystidia 9–13.5 μ m lata,

⁶) Etymology: eburneus, ivory coloured.

rara, fusiformia. Pleurocystidia nulla. Trama lamellarum iodi ope haud vivescens. Hyphae pileipellis 3.5–6.5 μm latae, fibulatae, leves, pigmento brunneo repletae. Hyphae stipitis corticales 2–3.5 μm latae, fibulatae, leves, caulocystidia 40–65 \times 8–15 μm , clavata, fibulata, levia, longe pediculata.

In pratis.

Holotypus: *C. Bas 4147* (No. 969.134-074a; L).

Basidiomata scattered. Pileus 12–17 mm across, obovoid to parabolical, then semi-globose with small umbo, finally planoconvex or with the centre somewhat depressed, at first somewhat viscid, then dry with slightly squamulose centre, appressed-fibrillose towards the margin, sulcate, translucent-striate, somewhat hygrophanous, more or less ivory coloured when moist, drying very pale buff, with brown centre and faintly brownish appressed fibrils. Flesh thin, pallid. Taste faint, somewhat chemical, odour faint, slightly aromatic-fungoid. Lamellae c. 23 reaching the stipe, tender, ascending, hardly 1 mm broad, fairly thick, free or narrowly adnate, white to very pale dingy buff, the edge convex, concolorous. Stipe 18–32 \times 0.7–1.5 mm, hollow, equal, terete for the greater part, apically minutely pruinose-flocculose, white to somewhat ivory coloured, with swollen base?

Basidia (none seen mature) c. 25 \times 7 μm , clavate, 4-spored, clamped, with sterigmata 4.5 μm long. Spores (abundant) 6.7–8.1 \times 5.8–7.1 μm , globose to subglobose, smooth, amyloid, with pronounced apiculus. Cheilocystidia (very few seen) 9–13.5 μm broad, fusiform, smooth, little projecting. Pleurocystidia absent. Lamellar trama not vivescent in Melzer's reagent. Pileipellis an epicutis with repent, radially aligned, smooth hyphae, 3.5–6.5 μm wide, with brownish vacuolar contents. Pileocystidia not observed. Hyphae of the cortical layer of the stipe 2–3.5 μm wide, clamped, smooth. Caulocystidia 40–65 \times 8–15 μm , clavate, clamped, smooth, in part geniculate, long-stalked. Trama of the stipe sarcodimitic, containing fusiform, unbranched hyphae, at least 300 μm long and 20–27 μm wide, with metachromatic cell-walls.

In grass land grazed by cattle.

Holotype: 'Fungi of India / *Hydropus eburneus* Maas G. / Punjab, Kulu Valley / 17 Aug. 1964 / *C. Bas 4147* / c. 1200 m alt. (No. 969.134-074a; L).

The macroscopic description of the species is adapted from the collector's notes, complemented by my own observations on the dried material. The microscopic details are based on reexamination of the type.

Apparent lack of pileocystidia, presence of hyphae of the pileipellis with brownish vacuolar contents, amyloid spores, and absence of pleurocystidia identify the present species as a member of *Hydropus* sect. *Floccipedes* (Kühn.) ex Sing., subsect. *Spurii* (Kühn.) ex Sing. (Singer, 1962: 66; 1982: 112). The two species of this section thus far known – *Hydropus scabripes* (Murrill) Sing. and *H. taxodii* (Murrill) Sing. (Singer, 1986: 418) – possess pip-shaped spores and are different from *H. eburneus* in having dark flesh. *Hydropus scabripes*, moreover, can be told from *H. eburneus* by its much broader lamellae (3.5–6 mm, according to Smith, 1947: 236) and abundant cheilocystidia, while *H. taxodii* appears associated with *Taxodium*.

Pegler (1986: 183) gave a redescription of *Hydropus porphyrodes* (Berk. & Br.) Pegler from Sri Lanka which is characterized by subglobose spores of the same size as those of *H. eburneus*. One of the differences between the two species is that the lamellae of *H. porphyrodes* are described as 'adnate to adnato-decurrent ... 4–5 mm broad.'

There is another species with subglobose spores described by Hennings (1901: 334) from Saharanpur (India) as *Mycena conocephala* which has some characters rather similar to those of *H. eburneus*. Although the description by Hennings is rather too short to be of much use for identification, a few features are definitely not applicable to the present species, such as caespitose habitus, acute papilla crowning the conical and smooth pileus, and (apparently normally) adnate lamellae.

XEROMPHALINA Kühn. & Maire

Xeromphalina Kühn. & Maire, Bull. Soc. mycol. Fr. 50 (1934) 18 (footnote). — Type species: *Omphalina campanella* (Batsch: Fr.) Kummer (Donk, 1962: 300).

11. *Xeromphalina aspera* Maas G., spec. nov.⁷ — Figs. 55–61

Basidiomata fasciculata. Pileus (siccatus) 7–16 mm latus, campanulatus, tenuiter sulcatus, glaber, rubro-brunneus. Caro tenuis, supra pileo concolor, infra pallida, odore saporeque ignotis. Lamellae c. 21–25 stipitem attingentes, lentae, decurrentes, interdum furcatae, intervenosae, c. 1 mm latae, pileo pallidiores. Stipes 30–50 × 1–2 mm, fistulosus, lentus, aequalis pro maxima parte, cylindraceus, basi incrassatus usque ad 4 mm, omnino tomentosus, basi hirsutus, pileo pallidior potius flavobrunneus.

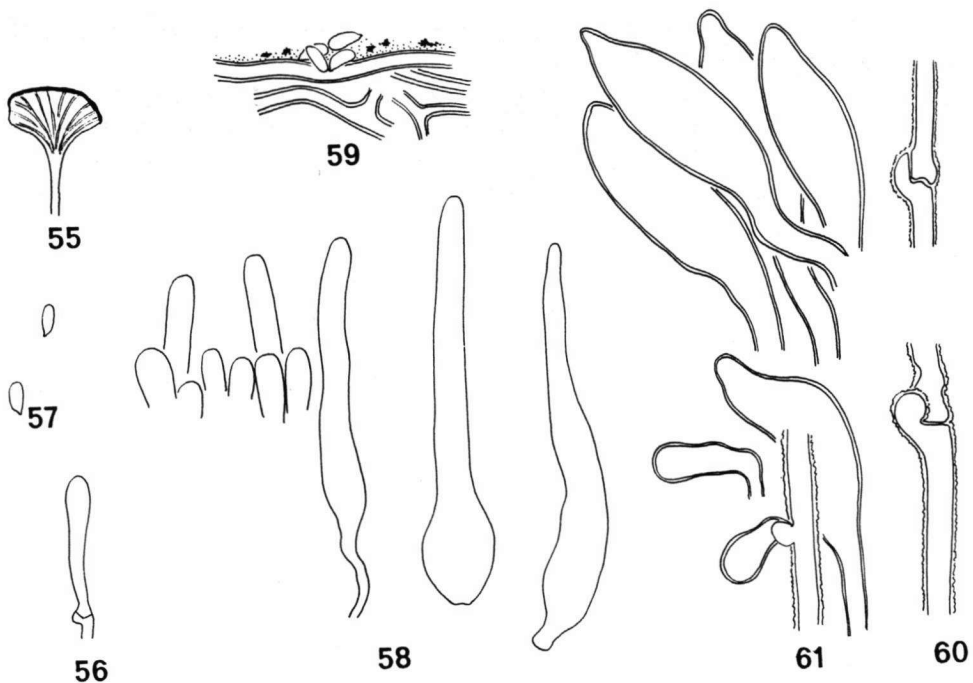
Basidia (immatura) c. 23.5 × 5.5 µm, clavata, 4-sporigera, fibulata, sterigmatibus c. 3.6 µm longis instructa. Sporae 4.9–5.6 × 2.2–2.7 µm, inaequilateraliter ellipsoideae, leves, amyloideae. Cheilocystidia 65–80 × 7–11.5 × 3.5–5.5 µm, sparsa, lageniformia vel subcylindracea, fibulata, levia. Pleurocystidia similia. Trama lamellarum iodi ope haud vivescens. Hyphae pileipellis 1.8–4.5 µm latae, fibulatae, parietibus crassis instructae, leves sed materia gelatinosa sordibus sporisque obtectae, pileocystidiis destitutae. Hyphae stipitis corticales 3.5–6.5 µm latae, fibulatae, parietibus crassis asperisque instructae, caulocystidia 13.5–63 × 7–12.5 µm, clavata vel fusiformia, fibulata.

Holotypus: *Stainton, Sykes & Williams 7881* ('*Mycena sanguinolenta*'; K).

Basidiomata fasciculate. Pileus (dried) 7–16 mm across, campanulate, shallowly sulcate, glabrous, reddish brown. Flesh thin, rather tough, concolorous with the pileus under the surface, pallid farther below. Odour and taste unknown. Lamellae c. 21–25 reaching the stipe, fairly tough, decurrent, occasionally furcate, intervenose, c. 1 mm broad, paler than the pileus, lamellar edge arcuate, concolorous with the sides. Stipe 30–50 × 1–2 mm, fistulose, tough, equal for the greater part, terete, gradually broadened towards the base up to 4 mm, matted tomentose throughout but hirsute at the base, paler than the pileus and rather more yellowish brown.

Basidia (none seen mature, springing from a dense and broad zone of intricately interconnected hyphae which may be the cause of the toughness of the lamellae) c. 23.5 × 5.5 µm, slender-clavate, 4-spored, clamped, with sterigmata c. 3.6 µm long. Spores 4.9–5.6 × 2.2–2.7 µm, narrowly pip-shaped, almost cylindrical, smooth, amyloid. Cheilocystidia 65–80 × 7–11.5 × 3.5–5.5 µm, not numerous, occurring mixed with the basidia, lageniform or subcylindrical, clamped, deep-seated, little projecting, smooth, thin-walled. Pleurocystidia similar. Lamellar trama not vivescent in Melzer's reagent. Hyphae of the pileipellis 1.8–4.5 µm wide, clamped, thick-walled, smooth but covered with gelatinous matter, dirt, and spores, pileocystidia absent. Hyphae of the cortical layer of the stipe 3.5–6.5 µm wide, clamped, thick-walled, lacking excrescences but very rough from

⁷) Etymology: *asper*, rough, referring to the rough, pigment-encrusted outer hyphae of the stipe.



Figs. 55–61. *Xeromphalina aspera* (Stainton, Sykes & Williams 7881; K). 55. Underside of flattened pileus, showing decurrent lamellae; 56. immature basidium; 57. spores; 58. cheilocystidia; 59. hyphae of the pileipellis; 60. hyphae of the cortical layer of the stipe; 61. caulocystidia. (Fig. 55, $\times 1$; all others, $\times 700$.)

pigment-incrustation, caulocystidia $13.5\text{--}63 \times 7\text{--}12.5\text{ }\mu\text{m}$, clavate to fusiform, clamped, fairly thick-walled, occurring mainly in the middle of the stipe and not infrequently in fascicles.

Trama of both pileus and stipe staining dark red-brown in KOH.

Found growing on a fallen tree in a wood.

Holotype: 'Flora of Nepal / [in pencil] *Mycena sanguinolenta* / Lete (S of Tukucha) Kali Gandaki / 8000 ft / 16.9.1954 / colour reddish-brown / Stainton, Sykes & Williams 7881' (K).

The description of the species is based entirely on my observations on the dried material. The only information on the colour given by the collectors is 'reddish-brown.'

Following Miller's subdivision of the genus (1968: 159), the present species belongs to section *Xeromphalina*, but it is difficult to make a choice between his subsections. Considering that the trama of the pileus stains a dark red-brown in KOH and the caulocystidia are fairly thick-walled and sometimes occur in fascicles, one would judge *X. aspera* to be a member of subsection *Mutabiles* A.H. Smith (later raised to section by Redhead, 1988: 480). However, the habit of the basidiomes in this subsection is solitary or gregarious to subcaespitose, and the caulocystidia are either narrow and hypha-like or irregular and contorted to branched. Fusiform caulocystidia similar to those of *X. aspera* are known to

occur in subsection *Xeromphalina*, but here these structures are thin-walled, while the pileus trama stains yellow in KOH.

Horak (1980: 104) described as a new species *Xeromphalina disseminata* from Sikkim which in view of its overall colouring could be mistaken for *X. aspera*. However, *X. disseminata* is stated to have a pileus 3–7 mm across (7–16 mm in dried condition in *X. aspera*), 8–14 lamellae (21–25 in *X. aspera*), a stipe which is pruinose at the apex (matted tomentose throughout in *X. aspera*), and rather larger spores, $5\text{--}6.5 \times 3 \mu\text{m}$ ($4.9\text{--}5.6 \times 2.2\text{--}2.7$ in *X. aspera*).

As is apparent from the title of his paper referred to above, Redhead placed the genus *Xeromphalina* in the family *Xerulaceae*. Having no intention just now to follow a path into what is largely terra incognita to me, I prefer to adhere to Singer's view (1986: 424) who regards the genus as a member of Fayod's tribus *Myceneae*.

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